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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/828,116	04/06/2001	Zhongnong Jiang	TI-32309	6799

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EXAMINER	
GRIER, LAURA A	

ART UNIT	PAPER NUMBER
2644	

DATE MAILED: 08/17/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/828,116	JIANG ET AL.	
	Examiner	Art Unit	
	Laura A. Grier	2644	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *23 May 2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *3,4,6-14,16-22 and 25-33* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *16 and 17* is/are allowed.

6)☒ Claim(s) *3,4,6,7,10,25-28 and 31* is/are rejected.

7)☒ Claim(s) *8-9, 12-14, 18-22, 29-30, 32, and 33* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. **Claim 3-4, 6-7, 10, 25, 26-28 and 31** are rejected under 35 U.S.C. 103(a) as being unpatentable over Wilson in view of Hausman et al., U. S. Patent No. 5262974 and Lee.

Regarding **claims 3 and 25**, Wilson discloses a method and system for compressing the dynamic range of audio signals (figures 3 and 5). Wilson's disclosure comprises a receiver receiving an audio input, wherein the audio input undergoes compression for the purposes of controlling level of the signal from clipping a signal when the signal exceeds a particular level, specifically in figure 3, a circuit is provided where an input is received, compression laws are applied to calculate a gain value (inherent as a compression ratio) in respect to the peak level of a signal, which reads on the input and compression circuit (col. 4, lines 13-58, and col. 10, lines 5-16, and figure 3). Wilson's disclosure indicates that a new gain can be calculated and provided to the gains adjuster for controlling the gain of the signal, and as well providing gain changes in the respect when sound level is above or below and certain predetermined level (col. 7 lines 3-53 accordingly, which teaches non-uniformed gain distribution by Wilson's gain calculators (figure 3, references 20 and 18); wherein, the gain gradient calculator calculates the rate adjustment of

the gains and is provided as a control signal to the gain adjuster, which justifies a type multiplier. However, Wilson fails to disclose the calculator as a CSD multiplier.

Regarding the CSD multiplier, in a similar field of endeavor, Hausman et al. (herein, Hausman) discloses a programmable CSD filter chip comprising a gain circuit (22) that includes a CSD multiplier (44) - (col. 3, lines 19-42), which indicates a gain comprising a CSD multiplier.

It would have been obvious to one of the ordinary skill in the art at the time the invention was made to modify the invention of Wilson by implementing CSD multiplier for the purpose of enabling efficient gain control with a flexible configuration in respect to size and enabling arbitrary gain control for desired precision with a small number of shifts, negation and additions as taught by Hausman, which constitutes for an increase in the speed of the gain control operation; wherein the use of CDS multipliers in gain controlling is a well technique as taught by Lee (col. 1, lines 7-41).

Regarding **claims 6 and 27**, respectively, Wilson, Hausman and Lee (herein, Wilson combination) disclose everything claimed as applied above (see claim 3 and 25, respectively). Wilson combination obviously discloses the CSD multiplier adjusting the gain in real time as evident of the enhanced and speedy processing capability of the CSD multiplier as taught by Hausman and Lee.

Regarding claim 26, Wilson combination discloses everything claimed as applied above (see claim 25). The Wilson combination thus obviously supports the gain being applied after the evaluation of the compression ratio as evident by the gain calculated in respect to the compression.

Regarding **claim 4**, Wilson discloses a method and system for compressing the dynamic range of audio signals (figures 3 and 5). Wilson's disclosure comprises a receiver receiving an audio input, wherein the audio input undergoes compression for the purposes of controlling level of the signal from clipping a signal when the signal exceeds a particular level, specifically in figure 3, a circuit is provided where an input is received, compression laws are applied to calculate a gain value (inherent as a compression ratio) in respect to the peak level of a signal, which reads on the input and compression circuit (col. 4, lines 13-58, and col. 10, lines 5-16, and figure 3). Wilson's disclosure indicates that a new gain can be calculated and provided to the gains adjuster for controlling the gain of the signal, and as well providing gain changes in the respect when sound level is above or below and certain predetermined level (col. 7 lines 3-53 accordingly, which teaches non-uniformed gain distribution by Wilson's gain calculators (figure 3, references 20 and 18); wherein, the gain gradient calculator calculates the rate adjustment of the gains and is provided as a control signal to the gain adjuster, which justifies a type multiplier. However, Wilson fails to disclose the calculator as a CSD multiplier.

Regarding the CSD multiplier, in a similar field of endeavor, Hausman discloses a programmable CSD filter chip comprising a gain circuit (22) that includes a CSD multiplier (44) - (col. 3, lines 19-42), which indicates a gain comprising a CSD multiplier.

It would have been obvious to one of the ordinary skill in the art at the time the invention was made to modify the invention of Wilson by implementing CSD multiplier for the purpose of enabling efficient gain control with a flexible configuration in respect to size and enabling arbitrary gain control for desired precision with a small number of shifts, negation and additions as taught by Hausman, which constitutes for an increase in the speed of the gain control

operation; wherein the use of CDS multipliers in gain controlling is a well technique as taught by Lee (col. 1, lines 7-41).

Eventhough, Wilson of the Wilson combination indicates that some of the parameters can be altered those of ordinary skill in the art. Further, the Wilson Combination fail to disclose the maximum gain step of the gain between .25 and .5db. Thus, it would have been obvious to one of the ordinary skill in the art at the time the invention was made to modify the invention of Wilson combination by providing a specific gain value for the purpose of optimizing the gain control performance as desired.

Regarding **claims 7 and 28**, Wilson discloses a method and system for compressing the dynamic range of audio signals (figures 3 and 5). Wilson's disclosure comprises a receiver receiving an audio input, wherein the audio input undergoes compression for the purposes of controlling level of the signal from clipping a signal when the signal exceeds a particular level, specifically in figure 3, a circuit is provided where an input is received, compression laws are applied to calculate a gain value (inherent as a compression ratio) in respect to the peak level of a signal, which reads on the input and compression circuit (col. 4, lines 13-58, and col. 10, lines 5-16, and figure 3). Wilson's disclosure indicates that a new gain can be calculated and provided to the gains adjuster for controlling the gain of the signal, and as well providing gain changes in the respect when sound level is above or below and certain predetermined level (col. 7 lines 3-53 accordingly, which teaches non-uniformed gain distribution by Wilson's gain calculators (figure 3, references 20 and 18); wherein, the gain gradient calculator calculates the rate adjustment of the gains and is provided as a control signal to the gain adjuster, which justifies a type multiplier. However, Wilson fails to disclose the calculator as a CSD multiplier.

Regarding the CSD multiplier, in a similar field of endeavor, Hausman discloses a programmable CSD filter chip comprising a gain circuit (22) that includes a CSD multiplier (44) - (col. 3, lines 19-42), which indicates a gain comprising a CSD multiplier.

It would have been obvious to one of the ordinary skill in the art at the time the invention was made to modify the invention of Wilson by implementing CSD multiplier for the purpose of enabling efficient gain control with a flexible configuration in respect to size and enabling arbitrary gain control for desired precision with a small number of shifts, negation and additions as taught by Hausman, which constitutes for an increase in the speed of the gain control operation; wherein the use of CDS multipliers in gain controlling is a well technique as taught by Lee (col. 1, lines 7-41).

Wilson combination (Hausman) does disclose a register (25) for the CSD multiplier for storing information indicative of the gain valuees, which indicates a second table. However, the Wilson combination fails to disclose a look-table storing discrete sound pressure level (values). The examiner takes official notice sound pressure level tables (volume registers or memories) were well known in the art. Thus, it would have been obvious to one of the ordinary skill in the art at the time the invention was made to modify the invention of Wilson combination by implementing a form of memory such a look-up table with sound pressure levels for the purpose being able to control the volume or level of the input signal as well to enable dynamic sound control.

Regarding claims 10 and 31, Wilson combination discloses everything claimed as applied above (see claim 7 and 28, respectively). Wilson combination (Hausman) obviously includes in

the compensation register (25) CSD codes as evident by the fact that the CSD multiplier is programmable and coding is the primary characteristic of a CSD multiplier.

3. **Claim 15** are rejected under 35 U.S.C. 103(a) as being unpatentable over Smart et al., U. S. Patent No. 5892834 in view of Dallavalle et al., U. S. Patent No. 5606625.

Regarding **claim 15**, Smart et al., (herein, Smart) discloses audio level dynamic range compression (figure 1). Smart's disclosure comprises a compression circuit (1) with an audio signal input into an audio processor including the amplifier (VCA), the compression circuit comprises a compression ratio (figure 2), wherein a compression ratio is applied to the input (digital value) signal when it is above the predetermined level (abstract), which reads on an input and compression circui. However, Smart fails to specifically disclose, the compression circuit having a state machine with a 1st and 2nd comparator and 1st and 2nd register, therein.

Regarding the compression having a state machine, in a similar field of endeavor, Dallavalle et al. (herein, Dallasvalle) discloses a digitial circuit to regulate the gain of an amplifier stage. Dallavalle's digital circuit reads on the state machine based upon its functions and components, wherein the components included a digital comparator (5) which compares the input signal to data provided thereto from the register (15), which indicates a 1st comparator and 1st register, digital comparator (6), which compares the input signal to data stored and provided thereto by the resister (11) and the threshold register (12) – figure 1, abstract, col. 2, lines 48 – col. 3, lines 28).

It would have been obvious to one of the ordinary skill in the art at the time the invention was made to modify the invention of Smart by implementing a digital circuit for effectively controlling the gain of analog signal after digitization to prevent distortion.

4. **Claims 8-9, 12-14, 18-22, and 29-30, 32-33** are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims and if the claims are rewritten to overcome the claim objection provided above.

5. Claims 16-17 are allowed.

Response to Arguments

6. Applicant's arguments filed 05/23/05 have been fully considered but they are not persuasive.

The applicant essentially argues that the prior art rejection fails to disclose the gain including a canonical signed digit (CSD) multiplier. The Hausman et al. reference used to modify the teachings of the Wilson reference discloses a gain calibration circuit, which indicates gain control, wherein the circuit comprises a canonical signed digit (CSD) multiplier, which provides adequate support of the claimed limitation. Thus, the Wilson, Hausman and Lee references is maintained.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Laura A. Grier whose telephone number is (571) 272-7518. The examiner can normally be reached on Monday - Friday, 7:30 am - 4:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vivian Chin can be reached on (571) 272-7848. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Laura A Grier
Primary Examiner
Art Unit 2644

August 16, 2005